

Amendment to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1-72. (canceled)

73. (currently amended) A cell-based assay method for determining a permeability of a cell membrane, the method comprising:

flowing a suspension of cells in a microchannel;

flowing a membrane permeable dye into the resulting flowing cell suspension, thereby contacting the cells and the dye;

~~incubating the cells and the dye in the microchannel for a time period sufficient for association of the dye with a plurality of the cells in the cell suspension;~~  
and,

monitoring a detectable signal from the dye after ~~association with the dye~~ contacts the cells, and

incubating the cells and the dye in the microchannel for a time period sufficient for the detectable signal from the dye to reach an equilibrium level, whereby the equilibrium level of the detectable signal is indicative of the permeability of the cell membrane.

74. (previously presented) The method of claim 73, wherein said flowing comprises: electroosmotic flow or pressure-based flow.

75. (previously presented) The method of claim 73, wherein the microchannel comprises a microfluidic device.

76. (previously presented) The method of claim 73, wherein the cells are selected from the group consisting of: bacteria, plant cells, animal cells, fungi, yeast, cardiac cells, and nerve cells.

77. (previously presented) The method of claim 73, wherein said flowing a dye comprises introduction of the dye into the microchannel through a side channel intersection.

78. (previously presented) The method of claim 73, wherein a time from contact of the cells and the dye to said detecting comprises about 100 seconds or less.

79. (previously presented) The method of claim 73, wherein the time from contact of the cells and the dye to said detecting ranges from about 75 seconds to about 10 seconds.

80. (currently amended) The method of claim 73, wherein the ~~association of the dye with a plurality of the cells comprises uptake the dye uptake by the cells.~~

81. (previously presented) The method of claim 73, wherein the cell suspension comprises from about 200 cells to about 50 cells.

82. (previously presented) The method of claim 73, wherein the dye is selected from the group consisting of: a fluorescent dye, a cation indicating dye, a calcium indicating dye, a membrane potential indicating dye, and a Nernstian dye.

83. (previously presented) The method of claim 73, further comprising contacting the cell suspension with a modulatory composition.

84. (previously presented) The method of claim 82, wherein the modulatory composition is selected from the group consisting of: a neurotoxin, a neurotransmitter, a protein, a peptide, a lipid, a carbohydrate, an organic molecule, a drug, a receptor ligand, an antibody, a cytokine, a chemokine, a hormone, and a cell.

85. (previously presented) The method of claim 82, wherein the detectable signal comprises detecting a change in the dye associated with a cell response to the modulatory

composition, wherein the change in the dye is selected from the group comprising: a changed fluorescence, a changed light absorbance, and a change in a luminesce.

86. (previously presented) The method of claim 84, wherein the cell response is selected from the group consisting of: a changed cation concentration, a changed membrane potential, and a changed calcium ion concentration.